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HP 4951C Protocol Analyzer

Getting Started

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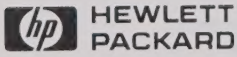

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Warranty

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, HP will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to the Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

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Safety

Prior to operation of the equipment you must examine the instrument and review this document to ensure you are completely familiar with all the safety markings and the operating instructions.

Warnings

The following *WARNINGs* define operating procedures, practices, etc., which, *if not correctly followed*, could result in personal injury or loss of life.

Warning This product is a Safety Class 1 instrument with a protective earth terminal.

Warning For protection from electric shock hazard, power cord ground must not be defeated.

Safety

The following general safety precautions must be observed during all phase of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings in this manual violates safety standards of design, manufacture, and intended use of this instrument. Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements.

Grounding

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor AC power cable compatible with an approved three-contact electrical outlet. The power jack and mating plug of the power cord must meet International Electrotechnical Commission (IEC) safety standards.

Environment

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

Service and Adjustment

Dangerous voltages exist within this instrument. Service and adjustment of this instrument is to be performed only by trained service personnel Operating personnel are not authorized to remove the instrument covers or to perform any internal service or adjustment procedure.

Do not replace components with the power cable connected. Dangerous voltages may be present even when the power cable is disconnected.

Do not perform internal servicing or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

CRT Handling

Rough handling or jarring of the instrument can break the CRT (cathode ray tube). The resulting implosion will scatter glass fragments at high velocity. Removal or installation of the CRT is to be performed only by qualified maintenance personnel using approved safety mask and gloves.

Unauthorized Service

The installation of substitute parts or the installation of any instrument modification not authorized by Hewlett-Packard is specifically forbidden. The performance of such unauthorized service can negate the instrument warranty or any maintenance agreements.

Return the instrument to a Hewlett-Packard Sales and Service Office for authorized service and repair.

Printing History

New editions are complete revisions of the manual. Update packages are issued between editions. They contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update. The edition does not change when an update is incorporated.

Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correlation between product updates and manual updates.

Edition 1..... June 1989

Syntax Conventions

The following symbols, abbreviations, and other conventions are used in this publication.

Warning	An operating procedure, practice, etc., which, if not correctly followed, could result in personal injury or loss of life.
Caution	An operating procedure, practice, etc. which, if not strictly observed, could result in damage to, or destruction of, equipment or software.
Note	Explanatory comments or supplementary instructions.

Before You Get Started

The HP 4951C is a portable, data communications protocol analyzer that can be used to install and maintain data networks up to 19.2 kbps.

Check the following items before operating your HP 4951C.

Voltage Selection. Before connecting any ac power, be sure the nominal line voltage for your area is between 100 - 240 ac at 48 to 66 Hz. To change the fuse, refer to Appendix E of the Operating manual.

Grounding Requirements. The HP 4951C is equipped with a three-conductor power cable which, when connected to an appropriate power outlet, grounds the analyzer. To preserve this protection, do not operate the analyzer from a line power outlet that has no ground protection.

Power Cord. The power cord packaged with each analyzer depends on its shipping destination. Appendix E of the Operating manual has a chart of power cord plugs matched to different areas. If your analyzer has the wrong power cord for your area, contact your HP Sales and Support Office.

Power Up and Installation

Warning Do not plug in the instrument until you are sure the line voltage is correct or damage to the instrument could result.

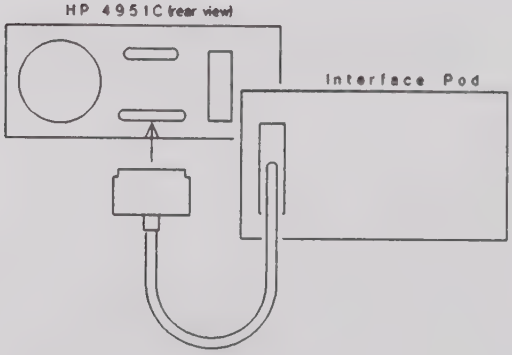
Connect the ac power cord to the HP 4951C power cord connector and then to the ac line connector. Set the power switch on the rear panel to the on (1) position.

Self-Tests. If your instrument displays the Top Level Menu after power-on, you can be confident that internal circuits (except disc drive and interface pod) are working correctly. Refer to Appendix E of the operating manual for complete information on performance verification procedures.

Connecting the Pod

Caution Always turn the instrument off before connecting or disconnecting the pod.

Connect the interface pod cable to the interface pod connector on the rear panel. Tighten the connector screws so that the cable does not pull off during operation.



Turning the HP 4951C OFF

Note Always go to the Top Level Menu before turning the instrument off.

Set the power switch on the rear panel to the off (0) position.

The HP 4951C contains a battery for maintaining current data and menu setups after turn off. However, if you turn off the analyzer at certain times (e.g., during a run) data or setups may be destroyed. A message to this effect then appears, and the analyzer resets itself automatically. To ensure that menus and setups are saved after turn off, always go to the Top Level Menu before turning the analyzer off. If you do not wish to save the menus and data, press **Reset** in the Top Level Menu to clear the memory and return to default settings.

Hookup

Hookup instructions are given in the appropriate sections. See Monitoring, Simulating, and BERT.

Front Panel Controls

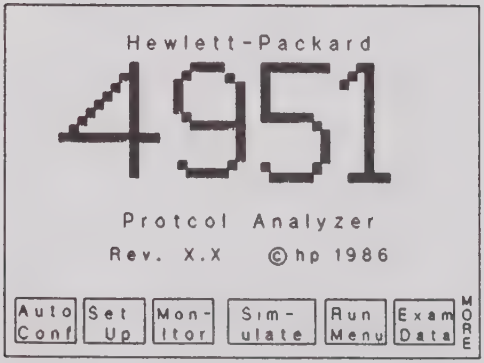
The HP 4951C has a full ASCII keyboard. The following keys have special functions:

SOFTKEYS	The six function keys directly under the display. The label of each key, shown at the bottom of the display, changes for each menu and field. Except when entering keyboard characters, use the softkeys to enter all parameter positions.
CURSOR KEYS	The four arrow keys which move the cursor.
EXIT	Accesses the Top Level Menu. During a run, EXIT is a **HALT** key. In some menus like BERT and Mass Store, you must press EXIT twice.
MORE	Accesses additional softkeys whenever more are available.
SHIFT	Selects lower-case characters when pressed with another key.
CNTL	Selects a control character (blue characters on keycaps) when pressed with another key.
RTN	Moves the cursor to the next lower field (same as cursor down).
DISPLAY	The 5 inch display shows 16 lines of 32 characters. Softkey labels occupy the bottom two lines.

The Top Level Menu

The Top Level Menu (Figure 1) accesses all instrument functions. Top Level Menu is displayed whenever the instrument is turned on. Press EXIT to access the Top Level Menu. Press MORE to see the other Top Level softkeys. Top Level softkeys are described below.

Auto Conf	Automatically configure to line parameters (when monitoring on-line).
Set Up	Manually configure to line parameters.
Monitor	Select monitoring measurements and triggers to analyze data.
Simulate	Select simulation measurements, triggers and send data.
Run Menu	Run monitor tests, simulation tests, or BERT tests.
Examine Data	Display data stored in the buffer or on disc.
Bert Menu	Configure Bit Error Rate Test parameters.
Remote	Transmit and receive menus and data to another HP 4951C, or to HP 4955A or HP 4953A.
Mass Store	Control disc functions.
Reset	Reset all menus to their default conditions and clear the buffer.
Self Test	Perform self test procedures.




```
--> Auto-     Setup     Monitor     Simulate     Run     Examine--->--
|   Config                                       Menu    Data        |
[MORE]                                                               [MORE]
|   BERT       Remote    Mass                              Reset   Self        |
--< Menu                 Store                             Test --<---
```

Figure 1. The Top Level Menu

Rear Panel Features

Here is a description of the HP 4951C rear panel features. Refer to Figure 2.

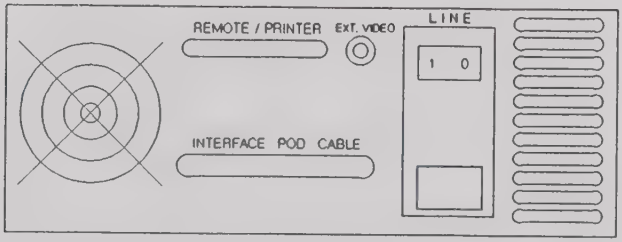
Line Switch — Press the left of the line switch to turn the instrument on. Press the right of the line switch to turn the instrument off. The line voltage does not have to be selected.

Remote/Printer — Use this connector to connect the HP 4951C in Remote Mode either as a controller or a slave unit.Also use this connector to connect an ASCII printer through which you can print display data.

Interface Pod — The interface pods are connected to this connector.

Ext Video — This connector lets you connect an external video monitor to the HP 4951C. The video output follows RS-170 conventions.

Figure 2. Rear Panel Features



The Four Instrument Functions

There are four basic functions of the instrument:

Monitoring	**Simulating**
Bit Error Rate Tests	**Remote**

These four functions are described in the next four sections.

Things To Remember

The Top Level Menu accesses all other menus.

EXIT will access the Top Level Menu at any time. In some menus you must press EXIT twice. EXIT acts like a halt key during program execution. EXIT stops execution and accesses the Top Level softkeys.

Press MORE to see any additional softkeys in any menu. A small vertical "more" at the lower right of the display prompts you whenever there is another softkey set in any menu.

Always go to the Top Level Menu before turning the analyzer off. This ensures that setups, data, and programs are saved in nonvolatile memory.

Caution Always turn the analyzer off before connecting and disconnecting the pod.

Monitoring

The HP 4951C monitor function is a window through which you can observe the activity on a data link. The HP 4951C lets you trigger on events and make measurements either on-line, or from the buffer memory. By monitoring from buffer memory, you can repeatedly post-process data after a run.

Hookup for Monitoring

Bridge the HP 4951C into the line, using the correct pod (e.g., RS-232C/V.24, V.35, or RS-449) and cables, similar to the diagram below. Hookup to each pod will vary. If you already have data in the buffer from a previous run or via disc, you can monitor from buffer; and no pod is necessary.

Always turn off the analyzer before connecting or disconnecting the interface pod.

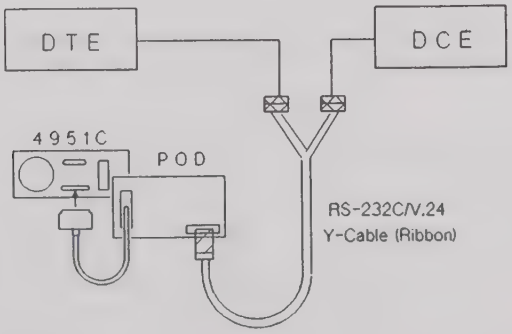


Figure 3. Hookup for Line Monitoring

Setup for Monitoring

Prior to monitoring, you must configure the HP 4951C for the line. You can use either Auto Configure or the Setup Menus. Setup selections affect the ability to capture meaningful data from the line and determine the available choices in other menus.

Using Auto Configure for Setup

Press **Auto Configure**. The HP 4951C identifies line parameters and begins monitoring.

At slow rates of data there is often not enough data present for the HP 4951C to identify the protocol and data rate. The 4951C then cannot "lock onto" the setup for the line being monitored.

Two things can be done:

1. Have a large file sent on the line from the host device.

2. Hold the return key down on a terminal on the line being monitored to cause more data to be sent over the line.

To change the display format, or to modify any setup parameters, halt the run by pressing EXIT, and go to the Setup Menu.

In some nonstandard protocols, the HP 4951C may not be able to identify all the parameters. In that case, halt the run and modify the setup in the Setup Menu.

Using the Setup Menu for Setup

To manually configure the HP 4951C, or to modify Auto Configure results, press **Setup** on the Top Level Menu.

1. Change any parameter by moving the cursor to that field and pressing the desired softkey.

2. To begin monitoring, press EXIT and then **Run Menu**. Then press **Monitor Line**. The HP 4951C begins filling the buffer and displaying data.

What to Do When the Protocol is Nonstandard

If you have trouble configuring the analyzer because of a non-standard protocol, or a defective line:

1. Use Auto Configure to give you a starting point.

2. Change the data code, or other parameters.

3. If some of the line data is still not meaningful, use the Char async/Sync protocol choice.

Setting Up Triggers

If you just want to look at the data, you can go right to the Run Menu and begin monitoring. However, if you want to perform tests and analyze the data, the Monitor Menu gives you that capability.

Here's a summary of the Monitor Menu functions:

Triggering	Define triggers with the `When` enabling.
Timing	Five timers measure intervals between triggers with 1 millisecond resolution and a maximum time of 65565 milliseconds.
Counting	The HP 4951C's five counters can each count up to 9999 events.
Conditional	The `If` statement performs actions.
Actions	Conditional, depending on the status of a counter or a lead at the time of the last trigger.

To access the Monitor Menu, press `Monitor` in the Top Level Menu. Then utilize the softkeys to modify or "build" a custom menu. See example Monitor Menus in the Example section.

Running the Test

Once Auto Configure has established the setup you can monitor the line or buffer on subsequent trials from the Run Menu.

If you are not using Auto Configure, press **Run Menu** on the Top Level Menu. To monitor on-line data, press **Monitor Line**. If data is already in the buffer from a previous run or from disc, press **Monitor Buffer** to do post processing.

When monitoring starts,

1. All counters and timers are reset to zero.
2. Any program in the Monitor Menu begins executing.
3. Buffer data is displayed starting at data block 1.

Halting the Run

Press EXIT to stop the test. The most recent data is displayed. You can freeze the display without halting the test by pressing **Stop Display**.

Changing Display Formats

To choose a different display format, halt the run and change the display format field in the Setup Menu.

Simulating

The HP 4951C can take the place of either a **DTE** (**D**ata **T**erminal Equipment) or **DCE** (**D**ata **C**ommunications **E**quipment), by supplying clocks, data, and error checks in the selected data code and protocol.

Hookup for Simulating

Disconnect the line and substitute the HP 4951C for the device (DTE or DCE) being simulated.

Always turn off the analyzer before connecting or disconnecting the interface pod.

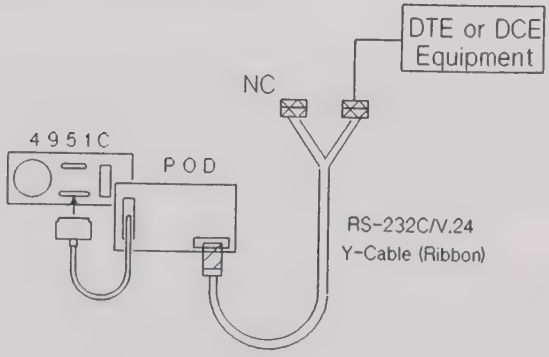


Figure 4. Simulation Hookup

Setup for Simulating

Use the Setup Menu to configure the HP 4951C to your system.

What If You Don't Know the Setup ?

You must know your system in order to simulate. However, you can find some parameters by observing the data line during monitor operation.

1. Hook up the HP 4951C for monitoring.

2. Use Auto Configure to find system parameters.

3. After monitoring for a few moments, go to the Examine Data Menu and look at the buffer data. To see the set up, press the `Timer & Counter` softkey.

4. Auto Configure selects SDLC for bit oriented protocols, and Char Async/Sync for character oriented protocols. You must observe the data in the buffer to find the exact Level 2 and Level 3 protocol on your line.

Setup Notes

- If DTE clock, Bits/sec, and Sync/Async (Char Async/Sync Menu) selections are incorrect, no data can be received or displayed.

- Protocol, data code, and error checking must be correct to ensure response by the device at the other end.

Simulate Menu Selections

Make the following entries in the Simulate Menu.

1. **Select DTE or DCE**

   Determine whether the HP 4951C is to be a DTE or a DCE. The HP 4951C sends data on pin 2 for simulating a DTE and sends data on pin 3 for simulating a DCE.

2. **Handshaking**

   Determine the handshaking requirements on the RS-232C/V.24, V.35, X.21 or RS-449 leads. The Set Lead softkey turns the leads on or off at the desired time. The HP 4951C normally sets all leads "off" before a test. The device at the other end may not respond if the appropriate control leads are not turned on or off at the proper times.

3. **Transmitting Data**

   Use the Send softkey to enter the characters to be transmitted, otherwise the HP 4951C only sends idles. You know the protocol and polling sequences being used on your line to ensure correct responses.

Other Entries

You can also set triggers, count events, measure time intervals, etc., in the Simulate Menu.

Running the Test

To execute a simulation program, use the Run Menu: Press **Run** on the Top Level Menu and select **Simulate**.

When simulation starts,

1. All counters and timers are reset to zero.

2. The HP 4951C turns on or off the leads as specified. Observe the pod LCDs or Leds for lead activity or use the Data & State display format.

3. The HP 4951C, acting like a DTE or DCE, sends out the specified data. Observe the pod LCDs or LEDs and the display.

4. In synchronous setups, the ETC clock is automatically provided when simulating a DTE. The TC and RC clocks are automatically provided when simulating a DCE. You must make the correct clock source setup selection to monitor the DTE line.

5. Line data and lead activity, from the HP 4951C and the other transmitting device, are stored in memory.

6. The display shows the data as it is stored in memory.

Press EXIT to stop the test. The last data loaded into memory is displayed. To execute the program again, press **Run Menu** on the Top Level Menu, and then **Simulate**.

Bit Error Rate Tests

Bit error rate tests measure the number of bit errors on a line: how often are "highs" changed to "lows" in error, and vice versa.

BERT Steps

1. Hookup

   a. End-to-End. Substitute a HP 4951C for the DTE at both ends of the line. (Figure-5).

   b. Loopback. Substitute an HP 4951C for only one DTE and "loopback" the modem or terminal at the other end of the line. (Figure 6).

2. Setup. Press **BERT** on the Top Level Menu and make the appropriate selections. NOTE: Select EXT for bits/sec and no framing on synchronous systems.

3. Running. Press **Run Menu** on the Top Level Menu. In the Run Menu, press **BERT**. The HP 4951C begins transmitting and receiving, and the display shows test status. Press EXIT to halt the test.

"Quick Brown Fox" and Startup Tests

Use the Simulation Menu to perform these tests. See examples 4, 9, and 10 in the Example section.

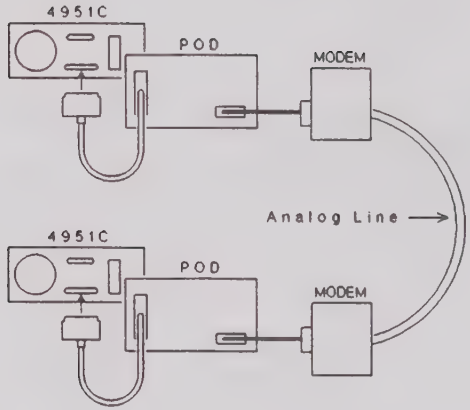


Figure 5. End-to-End BERT Hookup

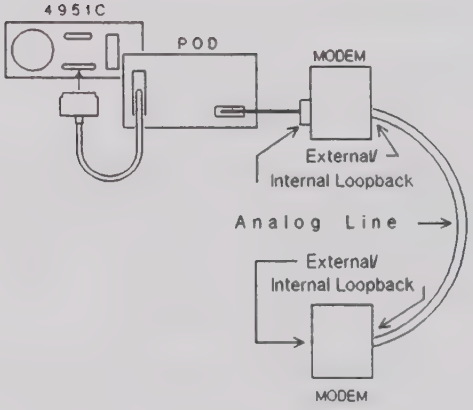


Figure 6. Loopback BERT Hookup

Remote Operations

The HP 4951C can transmit and receive menus and buffer memory remotely to or from an HP 4951A/B/C, an HP 4952A, an HP 4955A, or an HP 4953A. For remote operations, the HP 4951C must be executing in the Remote Menu.

Remote Procedure

1. Connect both slave and controller to asynchronous modems via the Remote/Printer (RS-232/V.24) connector on the rear panel or by using the interface pods.

2. At both sites go to the Remote Menu and select one as **Controller** and the other as **Slave** . Select the same Bits/sec for both slave and controller. When using an HP 4955A or HP 4953A as a controller, select the same address for slave and controller.

3. Select **Slave's I.D.** operation at the controller.

4. Press **Execute** at the slave, and then at the controller.

5. After establishing modem communication, at the controller site again **Execute** the **Slave's I.D** operation. This is necessary to synchronize remote transfers.

Using the HP 4951C as a Controller

As a Controller, the HP 4951C **downloads menus, data,** and **applications** to the Slave. The HP 4951C can also **receive menus, applications and data** from the Slave.

Upload Menus	Receives setup, monitor, simulate, and run menus from the slave. Start Block nl, End block n2.
Upload Data	Receives buffer data from the slave. You must specify the correct block limits in the slave upload Application. Receives an application program from the slave's Application Memory.
Download Menus	Transmits setup, monitor, simulate, and run menus to the slave.
Download Data	Transmits buffer data to the slave.
Download Appl.	Transmits an application program from its application memory to that of the slave.
Slave Status	Requests the slave to transmit its current status.
Slave ID	Necessary to initiate and synchronize remote transfers after hookup. A slave HP 4951C will transmit "HP 4951C".

Using the HP 4951C as a Slave

A slave HP 4951C responds to any commands from a controller HP 4951C.

HP 4955A and HP 4953A Controller Commands

Application programs cannot be transferred between an HP 4955A or HP 4953A and an HP 4951C. Other than this exception, an HP 4951C responds to all the commands from a Controller HP 4955A or HP 4953A (See the operation list on the previous page).

The following operations are different when an HP 4955A or HP 4953A controls an HP 4951C Slave.

Upload Timers & Counters

Upon receiving this command from an HP 4955A or HP 4953A controller, a slave HP 4951C uploads the status of its timers and counters.

Address

The HP 4955A or HP 4953A specifies an address in all controller commands. The slave address must be selected to be the same. The address does not matter in operations between two HP 4951Cs.

Ending Remote Operations

To stop execution of any remote operation, press EXIT. If you press EXIT again the HP 4951C displays the following message:

(To Disconnect the Remote Link, press the HANG UP softkey, otherwise press EXIT.)

Pressing **Hang Up** turns off DTR. If you press **Hang Up**, you must re-enter the Remote Menu and again press **Execute** at both ends of the line to raise DTR.

Pressing EXIT returns you to the Top Level Menu without turning off DTR. You can then go back to the Remote Menu at any time and perform any operation.

Operations With Asynchronous Modems

Only asynchronous modems can be used for remote transfers.

In remote operations, the HP 4951C is configured as a DTE. The following handshaking convention is used.

1. The HP 4951C sets RTS on and waits for CTS and CD to go on.

2. DTR is turned on when you press **Execute**. You must press **Execute** at both ends of the line. The HP 4951C then waits for DSR to go on.

Operations Without Modems

The HP 4951C is configured as a DTE for remote operations. If two units are connected directly without modems, a modem eliminator must be used. For applications with no modem, use a modem eliminator cable such as the RS-232C/V.24 printer cable (HP 13242G).

Auto Configure

How to Use Auto Configure

Hook up the analyzer to the line for monitoring (Refer to Figure 3 for "hook up' instructions). Press the `Auto Configure` softkey on the Top Level Menu.

Auto Configure as a Starting Point

Auto Configure works on most lines, with most protocols and data codes. Sometimes, however, there are nonstandard protocols where Auto Configure is unable to find all the parameters. The Setup Summary that appears before monitoring in Auto Configure tells you the missing parameters. You can then go to the appropriate Setup Menu and select the correct parameters. If Auto Configure has found all the parameters, but the data does not make sense, try another data code of the same size.

Auto Configure alters the Setup Menu and the buffer data; if you need the present setup and buffer data, save them on disc.

If unable to autoconfigure, please note that the 4951C may not have seen enough data to make a good decision as to what's going on. Try these two suggestions to enable the HP 4951C to "lock on".

1. Have a large file sent from the host device to the device being monitored.

2. Hold the return key down on the terminal or device being monitored.

Auto Configure Assumptions

The HP 4951C makes the following assumptions for implementation of Auto Configure.

1. Both data and idle conditions must be present. Asynchronous protocols must have a minimum of two idle characters between messages.

2. A transmit (TC or ETC) clock (x1) must be present for synchronous data. In synchronous NRZ1 mode, the clock must be encoded with the data.

3. Synchronous character oriented protocols must have sync characters present at least once in a 50-100 character sequence and the sync pattern must be preceded by two idle characters.

4. Auto Configure requires a variety of alphanumeric, control, and binary characters in the data. There must be non-restive data of different types for Auto Configure to make an identification. For example, if only lower case ASC11 characters are sent, EBCD code might be selected.

5. There must be at least on "o" bit preceded and followed by a "1" bit, in a 50-100 character sequence.

6. In bit oriented protocols, there must be at least one good Frame Check Sequence (FCS).

7. In bit oriented protocols, at least one frame must be less than 255 characaters in length.

Bit Oriented Protocols

Auto Configure always selects SDLC for bit oriented protocols. Monitoring is always correct except in some cases of X.25, or HDLC with extended address and control. If the data does not make sense, try another data code and other modifications to the Setup Menu.

Character Oriented Protocols

Because Auto Configure always selects Char Asyn/Syn for all character oriented protocols, you must determine the exact protocol from the parameters displayed. Unlike standard BSC, Char Asyn/Syn allows full duplex operation.

Examine Data Menu

Viewing the Buffer

Press Exam Data on the Top Level Menu to look at the buffer after run-time. Note how this differs from monitoring on-line, monitoring from buffer, or simulating. The Examine Data Menu lets you scroll forward **and backward** through the entire 32 Kbyte buffer.

What is Stored in the Buffer

Most line activity is stored in the buffer allowing the HP 4951C to post-process data from the buffer. The following items are stored:

1. DTE and DCE characters.
2. Lead changes on the five interface leads. Select Data & State display format or use the highlight feature in the monitor and Simulate Menus.
3. Errors, such as parity, BCC, and FCS.
4. Frame markers and packet markers.
5. Time marks and lead status.

How to Load the Buffer

The buffer is continually being loaded with data when monitoring on-line or simulating. The buffer can also be loaded from disc.

Uses for the Examine Data Menu

Viewing Timers and Counters after a run. The Examine Data Menu lets you look at the final state of the timers and counters after a run.

Viewing the Entire Buffer. The Examine Data Menu lets you go back after a run and scroll through the buffer.

Bit Shifting. If the framing is off because the sync characters are unknown, use the bit shift softkey in the Examine Data Menu to realign the bits until the data becomes meaningful.

Decoding Characters. Move the cursor to any character and observe the binary, hex, parity bit and octal equivalents at the top of the display.

Decoding Packets. In X.25 setup and Frame & Packet display format, the HP 4951C decodes packet headers simultaneously with control field information in the Examine Data Menu.

Decoding High Level Protocols. If the data contains other higher level protocol information (e.g., ISO levels 4-7, or SNA) the relevant fields can be read from the hex/octal/binary decoding at the top of the display.

Softkeys

Hex/Text. Displays buffer data in either the code selected in the Setup Menu, or in hexadecimal.

Roll Up/Roll Down. Lets you move the displayed buffer data up or down one line at a time.

Next Page/Prev Page. Moves from one display full of data to another. A page is one full display of information.

Timers & Counters. You can at any time look at a summary of the Setup parameters, as well as the status of the timers and counters at the end of the last run.

Specify Block. For specifying a particular 2 Kbyte block. The block number indicates the first character's position in the buffer. Some buffer information, like time marks, are not displayed, so <Next Page> may cause the block number to jump by several numbers. Buffer data loaded from disc may have block numbers as high as 308.

Next Highlight. This softkey lets you move to the next high-lighted event.

Next Segmt/Prev Segmt. These softkeys load either the next or the previous 16 Kbytes of data from disc into the buffer for observation. This choice appears only when you have loaded a disc file.

Bit Shift. Shifts framing of the displayed characters one bit at a time. Use this softkey to find the correct framing of unknown protocols. The parity bit is not shifted. This choice appears only in character oriented setups.

Displaying Data

The same five display formats available during run-time are available in examine data.

DTE	DTE data only. Displayed in regular video.
DCE	DCE data only. Displayed in inverse video.
Two Line	DTE over DCE. DCE data is displayed in inverse video.
Data & State	DTE over DCE data, and timing diagrams of four interface leads.
Frame & Packet	Decodes bit oriented frames. In the Examine Data Menu only, decodes X.25 packets.

How Setup Affects Display

In some display formats you may not be able to observe the buffer data. For example, with frame & packet format, you cannot see BSC data. Data & State format always shows any data in the buffer, even when it consists only of lead transitions.

Blinking Characters

Blinking characters indicate failed error checks: BCC, FCS, parity, or framing errors resulting from incorrect setup or loss of synchronization.

Examples

Example 1 Measuring a Single RTS-CTS Delay

This test measures the time from when RTS goes on until CTS goes on. Use the **Monitor** menu for this example.

To view the timers and counters, press **Summary** during run-time, or **Timer & Cntr** in the Examine Data Menu after run-time.

Note that timer measurements must be referenced to a preceding trigger for accurate measurements.

PROGRAM	DESCRIPTION
Block 1 When Lead RTS goes On then goto Block 2	
Block 2: Start Timer 1	Timer 1 indicates RTS-CTS delay.
When Lead CTS goes On	Note that Start and Stop
then goto Block 3	statements must be preceded by When statements for accurate timing.
Block 3: Stop Tests	

Example 2 Monitoring a DCE

In this example, you monitor a DCE by simulating the DTE through the **Simulate** menu. When simulating a DTE, the HP 4951C supplies the ETC clock. Upon receiving the proper clocks and lead commands, the DCE begins sending data, which the HP 4951C automatically stores and displays while in the simulate mode.

```
Simulate DTE

Block 1:   Set Lead DTR  On
             and then

           Set Lead RTS  On
```

Example 3 Monitoring a DTE

In this example, you monitor a DTE by simulating a DCE. When simulating a DCE, the HP 4951C automatically supplies both the TC and RC clocks. Upon receiving the proper clocks and lead commands, the DTE begins sending data, which the HP 4951C automatically stores and displays while in the simulate mode.

```
Simulate DCE

Block 1:   Set Lead DSR  On
             and then
           Set Lead CD  On
             and then
           Set Lead CTS  On
```

Example 4 Fox Message

This test checks the ability of asynchronous terminals and printers to receive and display data. The "FOX" message is transmitted to the terminal using the **Simulate** menu and then the echo from the terminal is checked for parity errors.

```
Simulate DCE

Block 1:   Send THE QUICK BROWN FOX
           JUMPS OVER A LAZY DOG 012
           3456789.

Block 2:   When Error Parity on DTE
             then goto Block 3
           When DCE .
             then goto Block 1

Block 3:   Increment Counter 1
             and then
           Goto Block 2
```

Example 5 Counting Parity Errors

This program uses the **Monitor** menu to count the number of Parity errors on both the DTE and DCE lines and keep track of the number of minutes of the test.

```
Block 1:  When DTE X                    Timer 5 starts when any
            or                          character is sent on the
          When DCE X                    DTE or DCE line.  ("X" =
            then goto Block 2           don't       care.)

Block 2:  Start Timer 5                 Timer 5 counts mil-
                                        liseconds up to one
                                        minute.

Block 3:  When Error Parity on DTE
            then goto Block 4
          When Error Parity on DCE
            then goto Block 5
          When Timer 5 is > 59999
            then goto Block 6

Block 4:  Increment Counter 1           Counter 1 indicates DTE
            and then                    errors.
          Goto Block 3

Block 5:  Increment Counter 2           Counter 2 indicates DCE
            and then                    errors.
          Goto Block 3

Block 6:  Increment Counter 5           Counter 5 keeps track of the
            and then                    number of minutes into the test.
          Reset Timer 5
            and then
          Goto Block 2
```

Example 6 Measuring More Than One RTS - CTS Delay

This test measures RTS-CTS delays until stopped. Use the **Monitor** Menu for this example.

Timer 1 and Timer 2 measures alternate delays. If only one timer were used, you would not have had enough time to see the timer before it was reset.

To view the timers and counters press **Summary** in the Run Menu during run-time. After run-time press **Timer & Counter** in the Examine Data Menu.

```
Block 1:   When Lead RTS goes On
             then goto Block 2

Block 2:   Reset Timer 1              Timer 1 measures the first
             and then                 RTS-CTS delay.
           Start Timer 1

           When Lead CTS goes On      The two "When" statements
             then goto Block 3        are ORed together.
           When Lead RTS goes Off
             then goto Block 6

Block 3:   Stop Timer 1

           When Lead RTS goes On      You can now view timer 1
             then goto Block 4        while the analyzer finds
                                      the next delay.
```

Example 6 - continued

Block 4:	Reset Timer 2 and then Start Timer 2	Blocks 3-5 duplicate blocks 1-2. Timer 2 now measures the next RTS-CTS delay. Thus,
	When Lead CTS goes On then goto Block 5	the user has time to view timer 1 before it is reset.
	When Lead RTS goes Off then goto Block 6	The two "When" statements are ORed.
Block 5:	Stop Timer 2 and then Goto Block 1	Control is looped back to Block 1.
Block 6:	Reset Timer 1 and then Reset Timer 2 and then Beep and then Goto Block 1	If RTS goes off before CTS goes on the timers are reset and an alarm "beep" occurs.

Example 7 Simulating RTS-CTS Delay

In this test, you substitute the HP 4951C for the DTE. Thus, you can test the modem in isolation.

Timer 1 measures the time it takes for the modem to respond with CTS on.

```
Simulate DTE

Block 1:   Set Lead RTS On

           When Lead RTS goes On
             then goto Block 2

Block 2:   Reset Timer 1                 Timer 1 is reset because the
             and then                    program later loops back to
           Start Timer 1                 this block.
             and then
           Start Timer 5                 Timer 1 shows CTS response
                                         time.
           When Lead CTS goes On
             then goto Block 3
           When Timer 5 > 2000           Timer 5 causes the instru-
             then goto Block 4           ment to beep if CTS does not
                                         go on within 2 seconds.

Block 3:   Reset Timer 5
             and then
           Stop Timer 1
             and then
           Set Lead RTS Off              RTS is now turned off and
             and then                    the test begun again after
           Wait 29999                    30 seconds. (You can change
             and then                    this delay.)
           Goto Block 1
```

EXAMPLE 7 - continued

```
Block 4:   Reset Timer 5                 Block 4 is the "error
             and then                    block".  If CTS does not go

           Reset Timer 1                 on two seconds after RTS
             and then                    goes on, the analyzer beeps
           Beep                          and restarts the test.
             and then
           Set Lead RTS Off
             and then
           Wait 250
             and then
           Goto Block 1
```

Example 8 Loopback

In this test, the local modem is looped back. The HP 4951C is substituted for the DTE and sends the "Quick Brown Fox" message 100 times. The modem is checked for proper handshaking and echo response.

```
Simulate DTE

Block 1:   Set Lead RTS  On
             and then
           Start Timer 5

           When Lead CTS goes On          The modem is checked for
             then goto Block 2            correct handshaking
                                          response.

           When Timer 5 is > 2000         Timer 5 indicates whether
             the modem
             then goto Block 8            responds within 2 seconds.

Block 2:   Reset Timer 5                  Timer 5 is reset for the
             and then                     next loop.
           Send THE QUICK BROWN FOX       The message is sent to the
           JUMPS OVER A LAZY DOG 012      modem.
           3456789.
             and then
           Set lead RTS  Off
Block 3:   When DCE THE QUICK BROWN       The modem is checked to
           see
           FOX JUMPS OVER A LAZY DOG      whether it echoes back
                                          each
            0123456789                    character.
             then goto Block 5
           When Lead CTS goes Off         Because the two "when"
             then goto Block 4            statements are ORed, every
                                          character must be received
                                          before CTS goes off.
```

Block 4:	Increment Counter 2	Counter 2 indicates the number of times this does not happen.
Block 5:	Increment Counter 1	Counter 1 shows the total number of transactions up to
	If Counter 1 is > 99 then goto Block 7	100.
Block 6:	Goto Block 1	The test starts over.
Block 7:	Stop Tests	
Block 8:	Reset Timer 5 and then Beep and then Goto Block 1	An alarm "beep" indicates a lack of modem response.

Example 9 End-to-End: Transmit First (HP 4925 Compatible)

The End-to-End test consists of the two programs described in Examples 9 and 10.

In the End-to-End Test, two HP 4951C's (or an HP 4951C and an HP 4925) are substituted for the DTE's at both ends of a line. Handshaking and messages are performed and checked 100 times. Except for the fact that one DTE transmits first, and the other DTE receives first, both programs are identical. There are two sections to this program: In blocks 5-6 this DTE is transmitting; in blocks 1-4 this DTE is receiving. Counter 1 indicates how many times the test failed. Counter 2 indicates the total number of transactions.

Note The "receive first" unit must be started first.

The proper setup is necessary for this test. Use the Char Async/Sync Menu with all the default selections except the following:

```
    Data Code  Hex 8          Drop sync  4  chrs after  18 18 18 18 18 18 18 18

    Sync on  FF 93

Simulate DTE

Block 1:   Goto Block 6                    The program immediately
                                           jumps to the transmit
                                           section.

Block 2:   Set Lead DTR  On
           If Lead CD is On                The If and When statements
             then goto Block 3             are ORed.
           When Lead CD goes On
             then goto Block 3

Block 3:   When Lead CD goes On            The two When statements are
             then goto Block 4             ORed: If CD goes off before
           When DCE 76 B3 FA 41            the message is received,
             then goto Block 5             then the error counter is
                                           incremented.The DCE characters
                                           are the same as those sent by the HP 4925
```

Block 4:	Beep and then Increment Counter 1	
Block 5:	Increment Counter 2	Counter 2 tells total transactions.
Block 6:	Wait 100 msec and then	The transmit section of the program begins.
	Set Lead RTS On	
	If Lead CTS is On then goto Block 7 When Lead CTS goes On then goto Block 7	
Block 7:	Send $^{F}_{F}$ $^{9}_{3}$ $^{7}_{6}$ $^{B}_{3}$ $^{F}_{A}$ $^{4}_{1}$ $^{1}_{8}$	This is the same message sent by a HP 4925
	When DTE $^{1}_{8}$ then goto Block 8	
Block 8:	Set Lead RTS Off	
	If Counter 2 > 99 then goto Block 10	When Counter 2 reaches 100, the test is ended.
Block 9:	Goto Block 2	
Block 10:	Stop Tests	

Example 10 END-TO-END: Receive First (HP 4925 Compatible)

This is the part of the END-TO-END TEST for the DTE which receives first. There are two sections to the program: In blocks 1-4 the DTE is transmitting; in blocks 5-6 the DTE is receiving. Counter 2 tells how many times the test failed. Counter 1 keeps track of the total number of transactions.

Note The "receive first" unit must be started first.

Use the Char Async/Sync Menu for the setup. Use all the default selections except the following:

```
Data Code  Hex 8                Drop sync  4  chrs after  18 18 18
18 18 18 18

Sync on  FF 93
```

```
Simulate DTE

Block 1:   Set Lead DTR  On              This is the Receive portion
                                         of the End-to-End test.
           If Lead CD is On
             then goto Block 2
           When Lead CD goes On
             then goto Block 2

Block 2:   When Lead CD goes Off         These two When statements
             then goto Block 3           are Ored.  If CD goes off
           When DCE 76 B3 FA 41          before this DTE has
             then goto Block 4           received the message,
                                         Counter 1 will indicate
                                         another failure.
Block 3:   Beep
             and then
           Increment Counter 1

Block 4:   Increment Counter 2           Counter 2 indicates
                                         another
```

transaction.

Block 5: Wait 100 msec
and then
Set Lead RTS On — The transmit section of the program begins.

If Lead ^{CTS} is ^{On}
then goto Block 6
When Lead ^{CTS} goes ^{On}
then goto Block 6

Block 6: Send $^{F}_{F}$ $^{9}_{3}$ $^{7}_{6}$ $^{B}_{3}$ $^{F}_{A}$ $^{4}_{1}$ $^{1}_{8}$ — This is the same message as that sent by an HP 4925

When DTE $^{1}_{8}$
then goto Block 7

Block 7: Set Lead RTS Off
If Counter 2 > 99 — When the total transactions = 100 the test is ended.
then goto Block 9

Block 8: Goto Block 1

Block 9: Stop Tests

ASCII Printer Output

The ASCII printer output application (supplied internally with the HP 4951C) lets you print buffer data, monitor and simulate menus, timer and counter results, and disc directories. HP 4951C display information can be sent to a printer via the Remote/Printer (RS-232C/V.24) connector on the rear panel or via the Interface Pod connector using the RS-232C/V.24 interface pod.

Items Required

To use this feature, you need to access the Printer Output application under the Mass Store menu. Use an ASCII Printer such as the HP 2601A, HP 2934A or ThinkJet Printer (HP 2225D). If you use the Remote/Printer connector on the rear panel, you need a modem eliminator cable (HP 13242G). If you use the Interface Pod connector on the rear panel, you need an RS-232C/V.24 interface pod such as the HP 18179A or HP 18180A.

Summary of Printer Operation

Hookup. Connect the ASCII printer to the remote/printer connector on the rear panel or to the RS-232C/V.24 pod.

Loading. Load the printer output application program from the Mass Store Menu.

Setup. In the Top Level Menu, select Printer Menu and make the desired selections.

Execution. Press <Execute> when the cursor is in any printer menu field (except the last).

Halting. Press EXIT to halt printing at any time and return to the printer menu.

External Video Output

The external video output is located on the rear panel of the HP 4951C. It is used to display the internal HP 4951C display on an external monitor.

What is RS-170?

This specification is the electrical characteristic for the video signal on monochrome video monitors. The HP 4951C utilizes this specification to display the internal CRT monitor on an external monitor. An example monitor is the HP 82913A which uses this standard.

RS-170 specifies the following: 525 lines per frame, 60 Hz refresh rate, a horizontal scan rate of 15.75 kHz.

Useage

The HP 4951C does not work well with standard television monitors. The reason for this is that standard television monitors are designed to overscan the picture/frame displayed. This means that standard television monitors are not designed to display the edges of the frame received (approximately 10% of the frame is not shown). The HP 4951C does display 100% of the frame and therefore the frame displayed on a standard television would not show the 10% of the edges of the frame shown on the internal HP 4951C monitor screen. The physical connector on the back of the HP-4951C is a 75 ohm BNC type connector.

Recommended Video Monitors

Europe	82913A opt. 1	12" screen	& cable	5061-6533
U.S.	82913A	12" screen	& cable	8120-470

Disc Operations

The Mass Store Menu is used for disc operations. The following softkeys appear when you press Mass Store in the Top Level Menu.

FORMAT

Erases the disc directory and places a new format on every track of the disc. This must always be used for blank discs. This process of formatting should take approximately 45 seconds.

LOAD

Allows files to be loaded from the disc. File names may be entered via the keyboard or by 'scrolling' to the file name using the cursor arrow keys before pressing the LOAD key.

STORE

Allows files to be stored to the disc. File names may be entered via the keyboard or by 'scrolling' to the file name using the cursor arrow keys before modifying the name and then pressing the Store key. File type must be specified and a comment is allowed to aid in file identification.

DELETE

Allows files to be marked for removal from the disc. File names may be entered via the keyboard or by 'scrolling' to the file name utilizing the cursor movement arrows before pressing the Delete key. The file is marked for deletion in the directory (a Del in the right most columns) but actually not deleted until a pack disc or store writes over the data.

RECOVER

Allows files marked for removal from the disc to be 're-stored' as valid active files in the directory. Only files created on a HP 4951 disc series protocol analyzer may be recovered. Each file name must be entered via the keyboard or by 'scrolling' to the file name using the cursor arrow keys before pressing the Recover key and then modifying the name. This can only be done before the disc has been packed.

PACK DISC

Lets the directory regain use of disc space lost when files and when 'run-time' files are created.

Once pack disc has been completed there is no way for the HP 4951C to recover the purged files.

DIR DIRECTORY

The directory Dir operation displays the disc contents giving File Name, File Type, and a Comment field. Five file types are possible:

MENU&DATA	Both buffer data and menus (setup,monitor, simulate, BERT).
MENU	Consists of menus only (setup,monitor simulate, BERT).
DATA	Buffer data only.
APPLIC	Only HP 4951C application files can be loaded.
EXTRUNDAT	Continuous store data file captured during run-time.

RENAME

Allows a file to be renamed or the comment associated with a file to be renamed.

CONVERT

Converts the ExtRunDat file type to a Menu & Data file type so that other Hewlett Packard protocol analyzers can read the data file. Only ExtRunDat file types may be converted.

PRINT APPL

Loads the Printer Application stored in firmware into the Application RAM. Any application currently loaded will be overwritten.

How to Load Data into the Buffer

Insert the disc into the disc slot. Press Dir in the Mass Store Menu to see how the file is listed on the disc. Press Load and cursor to the file name or type name or type in the file name as it is listed in the catalog. Press Execute to load the file into the memory.

Do not perform the load operation if you want to save present menu setups.The HP 4951C menu setups are changed by the load operation. The Setup, Monitor, Simulate, and BERT setups are all modified to the new values. You must first store these menus to another disc if you want to save them.

The HP 4951C menu setups are changed by the load operation. The Setup, Monitor, Simulate, and BERT setups are all modified to the new values. You must first store these menus to another disc if you want to save them.

How to Store to Disc

Insert a disc and format the disc if it is blank. Press Store enter the file name, the file type, and an optional comment; then press Execute. If the disc has insufficient room for a file, "Disc Full" is displayed.

Loading Files Larger Than the Buffer

When loading a disc file that is too large for the buffer the softkeys Next Disc Segmt and Prev Disc Segmt are automatically displayed in the Exam Data menu. You can scroll through the rest the of the file by using these softkeys.

Storing Directly to the Disc From the Line

To store directly to disc while monitoring or simulating on line, the Start disc command must be placed in the Monitor or Simulate program. For example:

```
Monitor

Block_1
Start Disc
```

Note You can only start and stop the disc once by program control.

There are two modes to storing to disc. These are: Continuous Loop (Cont Loop), and until Full.

Continuous Loop Verses Until Full When Storing From Line

Cont Loop. The Continuous Loop command instructs the HP 4951C to continue storing to the disc even after the disc is full. The HP 4951C will continue to store to disc until the [EXIT] key is pressed. The data on the disc will be overwritten in a circular fashion.

The created disc file type will be "ExtRunDat" if data from the line actually wraps around and overwrites data on the disc. If the data does not wrap around, then the created file type will be "Menu&Data".

Until Full. The Until Full command fills the disc with data until it is full," after which the disc stops, and the message "Disc Full" is displayed. The file type created on the disc will be "Menu&Data".

Convert Command. The "Convert" command converts an ExtRunData file to a Menu&Data file type. The <Convert>" key is located in the second row of softkeys in the Mass Store menu. It will only convert ExtRunDat files.

A

Error Messages

Application Denied

Cause This occurs when an attempt is made to load or rename an illegal application. This might be an application copied on another device other than another HP 4951C.

Action Check the application and insure that it is correct.

Application Not Copiable

Cause This occurs when an attempt is made to store an application that is not copiable.

Action Check the application and insure that it is not copy protected.

Bad Disc

Cause The disc will not format due to shaving too many bad tracks.

Action A disc having one or more bad tracks is considered not usable.

Baud rate > 19200 bps

Cause Auto Configure may work at higher rates.

Action Reduce the system bit rate to = 192000 bps.

Buffer empty

Cause The slave buffer is empty.

Action Check the content of the slave buffer with examine data. Retry the upload.

Buffer Size Too Small

Cause The controller is trying to download too much.

Action Reduce the size of the buffer being sent over the remote link to the slave HP 4951C.

Checksum error

Cause Bit errors have occurred. A bad CRC check occurred when attempting to read or write a file on the disc. Data is assumed to be corrupt when this error occurs.

Action Retry the operation. Disc may no longer be useable. Try another disc to help isolate the problem.

Controller Error

Cause The disc controller is not working properly.

Action Run disc self test to verify disc controller error.

Conversion error: menus reset

Cause This might occur if the menus being transferred are invalid.

Action Check menu compatibility. Retry menu transfer.

Drive Error

Cause The disc drive is not working properly, a hardware failure has occurred.

Action Run disc self test to verify disc controller error.

Directory Full

Cause The directory on the disc is full, and no other files can be written onto the disc. The directory can contain eighty files maximum.

Action Reduce the number of file names.

Disc Full

Cause The disc is full of data and no more will fit. This error occurs during write operations.

Action You can "pack" the disc using the Pack Disc softkey to possibly make enough space for the new file to fit.

Disc not formatted

Cause The disc has not been formatted.

Action The disc must be formatted before you can use it in the HP 4951C.

Disc Out

Cause The disc is out at the beginning of a disc operation, or the disc is taken out during a disc operation.

Action Make sure a disc is properly installed in the disc drive. Press **Dir**.

Disc removed during a Read operation

Cause When you remove the disc during a load operation, the buffer data is invalid.

Action Use the EXIT key to exit. Try loading the data again.

Disc read error: buffer data invalid

Cause This may be caused by checkrun error, a record not found, a corrupt file on disc, a broken disc controller, or by a worn out disc.

Action Use the EXIT key to exit. Try another disc to help isolate the problem.

Directory too large

Cause The disc has a directory that is too large. We format ten sectors for 80 entries for the directory.

Action Reduce the number of files by deleting unneeded files.

EOF error

Cause An attempt was made to read more records than exist in the file. The End Of File was found before the read completed.

Action RETRY, if it fails again - retry on a different disc. If the error persists, suspect a disc controller failure.

End of disc file

Cause When you specify a block number beyond the last block on disc.

Action Correct the block number specified so as to specify a block number on the disc.

End of valid data

Cause When you scroll to the end of buffer data.

Action Scroll backward.

File does not exist

Cause Attempt to load a file that does not exist or has been deleted.

Action Recheck the directory for the file name or use the **recover** function of mass store menu to try to replace the file into the directory so that it may be accessed.

File is not recoverable

Cause Attempt to recover a file that is not recoverable. Probably a file created on an instrument other than an HP 4951C.

Action Recheck the file and insure it's compatibility to the HP 4951C.

File name already exists

Cause Attempt to store a file with a name and type that already exists.

Action Recheck the name and/or type to insure either the name or the type is different from existing files.

File Not Compatible

Cause Attempt to load a file that is not compatible with the HP 4951. This ile could have the correct type but perhaps might be an application not compatible with the HP 4951C.

Action Recheck the file and insure it's compatibility to the HP 4951C.

Framing error

Cause Could not find a "1" stop bit in an asynchronous protocol. This error may occur because a transmit clock (TC or ETC) is missing in a synchronous protocol. The HP 4951C assumes an asynchronous protocol, but cannot then find the stop bit.

Action Check transmit clock indicators on the pod. Check protocol setup. Retry the transmission.

Improper format

Cause The disc format is not compatible with the HP 4951C for runtime use. The disc format is LIF but not formatted on a HP 4951C and will not work at runtime for writing to the disc.

Action Format the disc in/on a HP 4951C.

Invalid File Name

Cause Attempt to enter an invalid file name.

Action Correct the file name. Allowable characters are A - Z, numbers, and the underscore character. The file name must start with a capital alpha-numeric character.

Invalid File Type

Cause Attempt to load or store a file with a file type that is not valid on a HP 4951C.

Action Correct the file type to match with a compatible file type on the HP 4951C.

Invalid Mon/Sim Menu

Cause This may occur if you enter "When DTE/DCE" without completing the trigger branching instruction.

Action Examine monitor/simulate menu for incorrect parameter. Correct the error and retry.

Issue ID request to enable slave

Cause Failure to issue ID request to enable slave.

Action You must always **Execute** this operation immediately after establishing phone communication in order to synchronize remote transfers.

Max Length

Cause This message appears if you attempt to specify more than 255 characters in a single string.

Action Reduce the number of characters in the string.

Max Strings

Cause Appears if the Monitor and Simulate Menus combined contain strings which have a total of more than 2000 characters.

Action Reduce the number of characters in the string.

Media Wear Protected

Cause The disc is write protected because of excess wear on the disc. This prevents you from writing on a disc surface that is marginal.

Action Use another disc and copy this to that new disc as soon as possible.

Menu Full

Cause Appears if the Monitor and Simulate Menus combined contain more than 143 steps.

Action Reduce the number of steps.

Menus incompatible or corrupt

Cause This might occur for certain menus created by an HP 4955A or HP 4953A.

Action It may be possible to modify the existing menu to run on the HP 4951C. Examine the menu for any illegal parameters, correct and retry.

Modem handshake fails

Cause The controller RTS, CTS handshaking has failed.

Action Retry, while monitoring RTS & CTS line activity to help isolate the problem.

New name already exists

Cause Attempt to rename a file with a name and type that already exists.

Action Recheck the name and/or type to insure either the name or the type is different from existing files.

No application loaded

Cause Attempt to store an application when no application was loaded in the application portion of ram.

Action Load the application desired into the HP 4951C before trying to store it.

No data in buffer -- Use EXIT key to exit

Cause This occurs if the buffer is empty when you go to the Examine Data Menu.

Action Monitor On-Line
or load from the disc to fill the buffer.

No data in capture buffer

Cause This occurs if the buffer is empty when you try to store a menus & data file or a data file.

Action Monitor On-Line or load from the disc to fill the buffer.

No disc drive

Cause This indicates that a monitor or simulate menu was attempted to be executed with a "Start Disc" command and a disc drive is either not installed or is malfunctioning.

Action Use the self test mode to insure proper disc operation and/or insure that a disc drive is installed.

No displayable data in buffer for the selected display format

Cause This indicates that the buffer contains non-displayable data, such as lead transitions.

Action Use Data & State display format to see the lead transitions.

No data in requested blks

Cause The controller has requested data from empty blocks.

Action Adjust the blocks requested.

No data present

Cause There is no line data.

Action Both data and idle conditions must be present.

No Idles

Cause There are insufficient idles on the line.

Action Both data and idles must be present. Asynchronous protocols must have a minimum of two idle characters between messages.

No pod attached

Cause The pod is not attached.

Action Be sure to turn off the power before connecting the interface pod.

No Sync Characters

Cause Could not find any sync characters.

Action Try to sync on idles to capture all the data on the line and then check the data with examine data menu for the presence of sync characters.

Non LIF format

Cause The disc has been formatted, but the format is not the LIF format used by the HP 4951C.

Action Format the disc in/on a HP 4951C.

Nonstandard Baud Rate

Cause The bit rate is not within 5%.

Action Adjust bit rate of system the HP 4951C is attached to for monitoring/simulating.

No more highlights

Cause When you press the **Next Hilt** key and there are no more highlights.

Action View highlights again by returning to start of buffer (use ~Spec Block~) and then **Next Hilt**.

Out of lock -- data fault

Cause The tester couldn't synchronize at the beginning of the test because of a wrong pattern, or the absence of data.

Action Modify the Setup Menu and/or insure data is being sent over the line.

Out of lock -- sync loss

Cause The tester lost synchronization during the test.

Action Check the set up for sync characters and try again.

Operation not valid for HP 4951C

Cause The operation is one that only an HP 4955A or HP 4953A can perform.

Action Amend operation to comply with HP 4951C capabilities.

Record Not Found

Cause A track or sector was not found during a disc operation which could indicate a corrupt format on the disc or a worn disc.

Action Retry the read or write operation.

Single sided disc

Cause The disc has been formatted as a single-sided disc.

Action The HP 4951C uses a double-sided format specific to HP 4951C.

Seek error

Cause The disc controller cannot find a location on the disc that it expects to find.

Action Retry the operation. Retry the operation on another disc. If the error persists, destroy the disc the failure occurred on and use another.

Start block # must = first

Cause The controller has not specified the first block in the slave buffer.

Action Note that the first block may not be "1" if the buffer data has been loaded from disc.

Start of valid data

Cause When you scroll to the beginning of buffer data.

Action Scroll forward.

Write Protected

Cause The disc "write protect" tab is in the "protect" position. The tab will not be visible and a physical hole will exist in that portion of the disc case.

Action To store information on a write protected disc, slide the protect tab to the opposite position.

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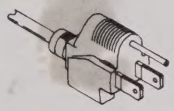
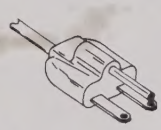
NOTICE

The following Hewlett-Packard power cords are included in the Canadian Standards Association (CSA) certification approval of HP telecommunications test equipment.

Only power cords approved by the CSA may be used in Canada.

Option	Plug Type	Plug Description	Length (In/cm)	Color	Part Number	Check Digit
9 0 3		Straight NEMA 5-15P 90°	80/203 80/203	Jade Gray Jade Gray	8120-1378 8120-1521	1 6
9 0 4		Straight NEMA 6-15P	90/228	Black	8120-0698	6

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